

What is claimed is:

1. A computerized method of allocating among a plurality of users bandwidth for conveying information across a shared communications medium, comprising the steps of:

- 5 (a) receiving data representative of past bandwidth of each user during a time interval;
- (b) forecasting future bandwidth of each user over a future time interval based on the data representative of the past bandwidth;
- (c) prioritizing users; and
- 10 (d) allocating bandwidth to each user sequentially in decreasing order of user priority.

2. The computerized method of claim 1, wherein the bandwidth that is monitored is the bandwidth requested for each user.

3. The computerized method of claim 1, wherein the bandwidth that is monitored is the bandwidth consumption of each user.

4. The computerized method of claim 3, wherein the bandwidth that is forecasted is the bandwidth consumption of each user.

5. The computerized method of claim 4, wherein users are prioritized based on each user's forecasted future bandwidth consumption in increasing order, whereby a user with a lesser forecasted bandwidth consumption receives a higher priority than a user with a greater forecasted bandwidth consumption.

6. The computerized method of claim 4, wherein each user's allocation of bandwidth for the future time interval is set to equal each user's forecasted bandwidth consumption subject to a respective, predetermined maximum value and subject to bandwidth availability

7. The computerized method of claim 6, further comprising distributing equally to the users any unallocated bandwidth.

8. The computerized method of claim 6, further comprising distributing to the users any unallocated bandwidth remaining in amounts proportional to the users' forecasted bandwidth consumptions.

9. The computerized method of claim 6, wherein the data representative of past bandwidth consumption comprise the number of logical data units transmitted from and to each user during the past time interval.

10. The computerized method of claim 6, wherein the data representative of past bandwidth consumption comprise data representative of the number of bytes transmitted from and to each user during the past time interval.

11. The computerized method of claim 6, wherein the data representative of past bandwidth consumption comprise data representative of the number of data packets transmitted from and to each user during the past time interval.

12. A computerized method of allocating among a plurality of users bandwidth for conveying information across a shared communications medium, comprising the steps of:

(a) receiving data representative of past bandwidth of each user during a time interval;

(b) forecasting future bandwidth of each user over a future time interval based on the data representative of the past bandwidth;

(c) setting each user's allocation of bandwidth for the future time interval equal to each user's forecasted bandwidth multiplied by a ratio of the total bandwidth available to the users' total forecasted bandwidth, and subject

to a respective, predetermined maximum value and subject to bandwidth availability.

13. The computerized method of claim 12, wherein the data representative of past bandwidth comprise the number of logical data units transmitted from and to each user during the past time interval.

14. The computerized method of claim 12, wherein the data representative of past bandwidth comprise data representative of the number of bytes and data packets transmitted from and to each user during the past time interval.

15. The computerized method of claim 12, wherein the data representative of past bandwidth comprise data representative of the number of logical data units of the user that are requested to be transmitted in an upstream direction during the past time interval.

16. A computerized method of allocating among a plurality of users bandwidth for conveying information across a shared communications medium, comprising the steps of:

(a) receiving data representative of past bandwidth of each user during a time interval, and data representative of respective fees that are charged to the users for bandwidth;

(b) forecasting future bandwidth of each user over a future time interval based on the data representative of the past bandwidth;

(c) prioritizing users based on the respective fee charged to each user in decreasing order, whereby a user with a higher fee receives a higher priority than a user with a lesser fee; and

(d) sequentially for each user in decreasing order of user priority, setting each user's allocation of bandwidth for the future time interval equal to each

user's forecasted bandwidth subject to a respective, predetermined maximum value and subject to availability.

17. The computerized method of claim 16, wherein the data representative of past bandwidth comprise the number of logical data units transmitted from and to each user during the past time interval.

18. The computerized method of claim 16, wherein the data representative of past bandwidth comprise data representative of the number of bytes and data packets transmitted from and to each user during the past time interval.

19. The computerized method of claim 16, wherein the data representative of past bandwidth comprise data representative of the number of logical data units of the user that are requested to be transmitted in an upstream direction during the past time interval.

20. A computerized method of allocating among a plurality of users bandwidth for conveying information across a shared communications medium, comprising the steps of:

(a) receiving data representative of past bandwidth of each user during a time interval, and data representative of respective credits that are applied to accounts of the users for bandwidth shortfalls below respective bandwidth levels specified to the users;

(b) forecasting future bandwidth by each user over a future time interval based on the data representative of the past bandwidth;

(c) prioritizing users based on the respective credit in decreasing order, whereby a user with a higher credit receives a higher priority than a user with a lesser credit; and

(d) sequentially for each user in decreasing order of user priority, setting each user's allocation of bandwidth for the future time interval equal to each user's forecasted bandwidth subject to a respective, predetermined maximum specified value and subject to availability.

5 21. The computerized method of claim 20, wherein any unallocated bandwidth remaining is distributed to the users sequentially in decreasing user priority such that each user's allocation equals the user's forecasted bandwidth, subject to a respective, predetermined maximum allowed value of bandwidth and subject to availability.

10 22. The computerized method of claim 20, wherein any unallocated bandwidth remaining is distributed equally to the users subject to a respective, predetermined maximum allowed value of bandwidth.

15 23. The computerized method of claim 20, further comprising setting each user's allocation of bandwidth for the future time interval only in an amount equal to the forecasted bandwidth of the user multiplied by the ratio of total bandwidth available for allocation to the total forecasted bandwidth of the users, but only when the total forecasted bandwidth exceeds the total bandwidth available for allocation.

20 24. The computerized method of claim 20, wherein the data representative of past bandwidth comprise the number of logical data units transmitted from and to each user during the past time interval.

25. The computerized method of claim 20, wherein the data representative of past bandwidth consumption comprise data representative of the number of bytes and data packets transmitted from and to each user during the past time interval.

26. The computerized method of claim 20, wherein the data representative of past bandwidth consumption comprise data representative of the number of logical data units of the user that are requested to be transmitted in an upstream direction during the past time interval.

5 27. A computer-readable medium having computer-executable instructions that allocates among a plurality of users bandwidth for conveying information across a shared communications medium, said instructions performing the steps of:

(a) receiving data representative of past bandwidth of each user during a time interval;

10 (b) forecasting future bandwidth of each user over a future time interval based on the data representative of the past bandwidth;

(c) prioritizing users based on each user's forecasted future bandwidth in increasing order, whereby a user with a lesser forecasted bandwidth receives a higher priority than a user with a greater forecasted bandwidth; and  
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(d) sequentially for each user in decreasing order of user priority, setting each user's allocation of bandwidth for the future time interval equal to each user's forecasted bandwidth subject to a respective, predetermined maximum value and subject to bandwidth availability.

20 28. The computer-readable medium of claim 27, wherein said instructions further perform the step of distributing equally to the users any unallocated bandwidth.

29. The computer-readable medium of claim 27, wherein said instructions further perform the step of distributing to the users any unallocated bandwidth remaining in amounts proportional to the users' forecasted bandwidths.

30. A computer-readable medium having computer-executable instructions that allocates among a plurality of users bandwidth for conveying information across a shared communications medium, said instructions performing the steps of:

- (a) receiving data representative of past bandwidth of each user during a time interval;
- (b) forecasting future bandwidth of each user over a future time interval based on the data representative of the past bandwidth;
- (c) setting each user's allocation of bandwidth for the future time interval equal to each user's forecasted bandwidth multiplied by a ratio of the total bandwidth available to the users' total forecasted bandwidth, and subject to a respective, predetermined maximum value and subject to bandwidth availability.

31. A computer-readable medium having computer-executable instructions that allocates among a plurality of users bandwidth for conveying information across a shared communications medium, said instructions performing the steps of:

- (a) receiving data representative of past bandwidth by each user during a time interval, and data representative of respective fees that are charged to the users for bandwidth;
- (b) forecasting future bandwidth by each user over a future time interval based on the data representative of the past bandwidth;
- (c) prioritizing users based on the respective fee in decreasing order, whereby a user with a higher fee receives a higher priority than a user with a lesser fee; and
- (d) sequentially for each user in decreasing order of user priority, setting each user's allocation of bandwidth for the future time interval equal to each

user's forecasted bandwidth subject to a respective, predetermined maximum specified value and subject to availability.

32. A computer-readable medium having computer-executable instructions that allocates among a plurality of users bandwidth for conveying information across a shared communications medium, said instructions performing the steps of:

(a) receiving data representative of past bandwidth of each user during a time interval, and data representative of respective credits that are applied to accounts of the users for bandwidth shortfalls below respective levels of network access specified to the users;

(b) forecasting future bandwidth of each user over a future time interval based on the data representative of the past bandwidth;

(c) prioritizing users based on the respective credit in decreasing order, whereby a user with a higher credit receives a higher priority than a user with a lesser credit; and

(d) sequentially for each user in decreasing order of user priority, setting each user's allocation of bandwidth for the future time interval equal to each user's forecasted bandwidth subject to a respective, predetermined maximum specified value and subject to availability.

33. The computer-readable medium of claim 32, wherein said instructions further perform the step of distributing any unallocated bandwidth to the users sequentially in decreasing user priority such that each user's allocation equals the user's forecasted bandwidth, subject to a respective, predetermined maximum allowed value of bandwidth and subject to availability.



34. The computer-readable medium of claim 32, wherein said instructions further perform the step of distributing any unallocated bandwidth equally to the users subject to a respective, predetermined maximum allowed value of bandwidth.

5 35. The computer-readable medium of claim 32, wherein said instructions further perform the step of setting each user's allocation of bandwidth for the future time interval only in an amount equal to the forecasted bandwidth of the user multiplied by the ratio of total bandwidth available for allocation to the total forecasted bandwidth of the users, but only when the total forecasted bandwidth exceeds the total bandwidth available for allocation.